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REMARKS

As required by 37 C.F.R. § 1.173(c), the status of the claims is as follows:

Claims	1-15	pending original claims
Claims	16-38	canceled new claims
Claim	39	amended new claim
Claims	40-43	pending new claims, previously added

Further, support for the addition to claim 39 of the phrase "...wherein the ambient of plasma includes nitrogen plasma" can be found at least at column 6, lines 28-40 of the specification, as well as original claims 8 and 13. Further, it is asserted that the above phrase has already been searched and considered by the Examiner previously, upon addressing cancelled claims 33 and 34 in the Office Action of December 3, 2003.

Pursuant to the "special" provision of MPEP 708.01 for reissue proceedings, the Applicants request the Examiner take up for action this reissue proceeding in advance of other applications/proceedings, except those involved in litigation, and prepare an office action in order that prompt issuance of a *Notice of Allowability* can be facilitated.

The Examiner's final Office Action of April 13, 2004 has been received and its contents reviewed. Accordingly, the Applicants respectfully request reconsideration of the above-identified application, in view of the above amendment to claim 39 and for the reasons to follow. The Examiner's continued indication that claims 1-15 are allowed is greatly appreciated.

With regard to the Examiner's request to re-submit a copy of the Application Data Sheet attached to the Amendment of March 30, 2004 (Certificate of Mailing of March 3, 2004), please find attached another copy of the Application Data Sheet (ADS) properly setting forth the foreign priority information. As noted in the March 30th Amendment, even though the foreign applications JP 10-254996, filed

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September 9, 1998, and JP 10-326352, filed November 17, 1998, have been set forth on the Official Filing Receipt, the Applicants hereby claim benefit, under 35 U.S.C. § 119, to:

JP 10-254996, filed September 9, 1998,

JP 10-326352, filed November 17, 1998

Accordingly, the requirements of 37 C.F.R. § 1.55, § 1.63(c)(2), § 1.76 and § 1.175 are deemed to have been satisfied, and, therefore, withdrawal of the objection to the original Declaration (PTO/SB/51), submitted November 13, 2001, is now in order.

Referring now with regard to the Examiner's rejections of:

Claims 39-40, under § 103(a), as being obvious in view of the combination of teachings of the Applicants Admitted Prior Art (AAPA), and Akasaki et al. (JP '679), and

Claims 41-43, under § 103(a), as being obvious in view of the combination of teachings of the Applicants Admitted Prior Art (AAPA), Akasaki et al. (JP '679) and Nagao JP ('471),

each of these rejections is traversed for the reasons set forth in the Amendment of March 30th (herein incorporated by reference) and further for the reasons to follow.

Specifically, a feature of the invention recited in the amended claim 39 resides in that after forming the Mg-doped layer of GaN, the p-side electrode is formed and then the annealing is performed in the ambient of plasma including nitrogen plasma at substrate temperature of 600°C or lower. According to the present invention, the bond of N-H is cleaved to dissociate H (hydrogen) by using an electron energy and a kinetic energy of the plasma, so as to activate Mg even at a substrate temperature of 600°C or lower. Moreover, since the annealing is performed in the ambient of plasma including nitrogen plasma, release of nitrogen from the GaN layer can be prevented during the annealing.

On the other hand, in the admitted prior art of the present application, the object is to perform a thermal annealing or a plasma annealing at a temperature of

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more than 600°C to activate Mg or the p-type dopant in the Mg-doped layer of GaN. However, since a temperature of the annealing is high and GaN is readily decomposed, a problem of the release of nitrogen from the GaN layer arises.

Akasaki et al. (JP '679) discloses that the p-side electrode is formed after the formation of the Mg-doped layer of GaN, and then the electron-beam is irradiated in a high vacuum so as to activate Mg or P-type dopant. In other words, the electron beam, more specifically, the local electron beam is irradiated at the Mg-doped layer of GaN to activate Mg or p-type dopant. Hence, the invention recited in the amended claim 39 is clearly different from the invention disclosed in Akasaki et al. in view of technologies of making the Mg-doped layer of GaN p-type.

Moreover, in Akasaki et al., the electron-beam irradiation treatment must be performed in high vacuum. However, at such very low pressures nitrogen is likely to be released from the GaN layer. Thus, Akasaki et al. has the very problem discussed in the AAPA, i.e., the problem of release of nitrogen from the GaN layer due to the electron-beam irradiation process. Furthermore, the electron beam process of Akasaki et al. irradiates only within a small range at a time, and it takes a long time to irradiate the whole substrate by the electron beam. Thus, Akasaki et al. also has the problem of low productivity also discussed in the AAPA.

For the aforementioned reasons, there is no motivation for combining the processing of Akasaki et al. - at temperatures of 600°C or less - in which the electron beam is used and no ambient of nitrogen plasma is required, with the AAPA, in which the ambient of nitrogen plasma is also not disclosed, in order to obtain the present invention (the amended claim 39) in which the conductivity type of the semiconductor layer is made into p-type in the ambient of nitrogen plasma at a temperature of 600°C or less as presently claimed. Hence, the invention recited in the amended claim 39 is not rendered obvious by the combination of Akasaki et al. and the AAPA.

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Further, the Applicants assert that the teachings of AAPA and the Akasaki et al. reference, even if combined, would not yield the invention as presently claimed since all the features of the claimed invention would not be taught or suggested, i.e., the conductivity type of the semiconductor layer is made into p-type in the ambient of nitrogen plasma at a temperature of 600°C. For these reasons, the combination of teachings of AAPA and Akasaki et al. does not establish a *prima facie* case of obviousness, and the rejection of claims 39 and 40, under § 103(a), must now be withdrawn.

With regard to the Examiner's citation of the Nagao (JP '471) reference in the rejection of claims 41-43, under § 103(a), a review of that reference reveals that, while teaching the use of an Al contact electrode in LED semiconductor device, the reference contains no teaching of plasma treating a p-type Group III nitride semiconductor layers to remove hydrogen and activate the p-type dopant, nor does Nagao contain any teaching of the equivalence between a plasma treatment method (for p-type Group III nitride semiconductor layers to remove hydrogen and activate the p-type dopant) and an e-beam treatment for the same layers. Without such teachings, the combination of teachings of AAPA, Akasaki et al. and Nagao also does not set forth a *prima facie* case of obviousness for claims 41-43, and therefore, the rejection of those claims, under § 103(a), has also been set forth in error and must be withdrawn.

Finally, as required by 35 U.S.C. 251, a supplemental declaration form PTO/SB/51 (unexecuted) is submitted herewith, a signed version of this form shall be submitted in due course. Upon an indication of allowability of all claims, the original Letter Patent shall be submitted, or a statement provided as to its loss or misplacement filed.

While the present application is now believed to be in condition for allowance, should the Examiner find some issue to remain unresolved, or should any new issues

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arise, which could be eliminated through discussions with Applicants' representative, then the Examiner is invited to contact the undersigned by telephone in order that the further prosecution of this application can thereby be expedited.

Respectfully submitted,



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